sensing aperture through which the sensor array **34** might operate can be comprised of a material that is different from the rest of the container **30**.

[0040] The nature of the invention is such that the container **30** storing the at least one fluid **32** can have a curved surface for attachment of the sensor array **34**. This is because the capacitance-sensitive proximity sensing technology of the sensor array **34** is capable of being disposed on a flexible substrate such as MYLAR™. The use of MYLAR™ for the substrate material enables the sensor array **34** to conform to slight surface contours that might be found in the shape of the container **30**. For example, a generally cylindrical glass container such as a bottle provides an arcuate or curved surface that is suitable for the attachment of the sensor array **34**. Likewise, a cylindrical underground storage tank for petrochemicals such as gasoline will also provide a suitable surface.

[0041] There are some useful observations that can be made regarding the container **30** through which the sensor array **34** can detect and/or examine a fluid **32** within. For example, the container **30** can have a variety of curved surfaces that can be used as a location for attachment of the sensor array **34**. When sensing directly through the walls of a container **30**, the materials used in the manufacture of the container are also many, and include glasses and plastics. This also means that while the sensor array **34** requires attachment to a non-metallic material in order to perform sensing of the at least one fluid **32** on the opposite side, the sensor array **34** could be disposed, for example, against a glass aperture that has been made part of a container wall, wherein the remainder of the container **30** can be constructed of metal or other materials that will otherwise interfere with the sensor array **34**. However, it is also important that the thickness of the material through which the capacitance-sensitive proximity sensing device must operate should not be made so thick as to interfere with fluid detection and/or examination. The closer the sensor array **34** of the capacitance-sensitive proximity sensing device is disposed to the at least one fluid **32**, the more accurate and perhaps the more detailed the information that can be obtained will be.

[0042] The nature of the capacitance-sensitive proximity sensing device that includes the sensor array **34** described above utilizes mutual capacitance technology to detect and derive information about the at least one fluid **32** in the container **30**. Mutual capacitance sensor technology is described, for example, in U.S. Pat. No. 5,305,017 issued to CIRQUE® Corporation. However, the capacitance-sensitive proximity sensing device of the invention also utilizes hidden touch surface HTS™ technology as described in issued U.S. Pat. No. 6,680,731 B2. This technology enables proximity sensing. In other words, it is not necessary for the at least one fluid **32** to be in physical contact with the sensor array **34** of the capacitance-sensitive proximity sensing device. The at least one fluid **32** must only be sufficiently close so as to be within a range of detection and/or examination of the present invention. Thus, the sensor array **34** may be disposed on the outside of a container **30** as long as the container wall is of a thickness and material that enable proximity sensing.

[0043] The electrodes of the sensor array **34** of the present invention are preferably comprised of a conductive ink that is "printed" onto MYLAR™ sheets and is described in the '731 patent. This method of fabrication is very simple and inexpensive. However, more conventional fabrication techniques that are used to manufacture conventional touch-sensitive touchpads such as those found in computer input devices can also be used.

[0044] So far, the specification has described a sensor array **34** of a capacitance-sensitive proximity sensing device that functions when disposed along the outside of a container **30**. Another aspect of the invention is to dispose the capacitance-sensitive proximity sensing device inside the container **30** itself. This process may be as simple as coupling the capacitance-sensitive proximity sensing device to an inside surface of the container **30**, and providing a means for signals to travel from the sensor array **34** to the touchpad control circuitry **36**.

[0045] If the fluid within the container **30** will not harm the sensor array **34**, the sensor array may be disposed so as to enter the fluid **32**. This is illustrated in FIG. **3**. FIG. **3** shows the container **30**, the fluid **32** within the container, the sensor array **34** at least partially disposed within the fluid, and touchpad sensor circuitry **36** coupled to the sensor array.

[0046] It is observed that given the fact that the invention utilizes electricity to function, it will most likely be necessary to cover and insulate all electrical circuitry and exposed elements and electrodes of the sensor array **34** the capacitance-sensitive proximity sensing device from the fluid **32** in the container **30**. It may also be necessary to protect the sensor array **34** from the corrosive and otherwise deleterious effects of the fluid **32** in the container **30**. Materials used to cover the all the elements of the capacitance-sensitive proximity sensing device are well known to those skilled in the art of insulating electronic components from fluids when working in wet and corrosive environments.

[0047] Having described the invention in general terms, it is useful to examine some experimental results that demonstrate the capabilities of the invention. In this example, three fluids were poured into a container. No attempt was made to adjust the amount of each fluid disposed therein. The fluids were generally not miscible, and were comprised of tap water, automobile engine oil, and alcohol. The container was open to air.

[0048] The three fluids and air have different densities. Accordingly, the fluids separated into vertically distinct layers in the container. The lowest fluid in the container was water, then oil, and finally alcohol.

[0049] The fluids **32** have different dielectric and electrical properties, thereby causing each fluid to affect the conductive elements of the sensor array **34** in different and detectable ways. In this experiment, a normal touchpad from CIRQUE® Corporation that is used in computer input applications, and manufactured with a MYLAR™ substrate, was lowered directly into the fluid **32** in the container **30**. The sensor array **34** was held in a vertically parallel orientation with respect to the upright sidewalls of the container **30**. The sensor array **34** was coupled to touchpad sensor circuitry **36** also from CIRQUE® Corporation. The output of the electronic circuitry was then shown on a computer display as shown in FIG. **4**.

[0050] The computer display is simply one means by which signal strength information can be recognized as indicating a difference in detectable characteristics of different fluids that were in proximity to the capacitance-sensitive proximity sensing device. The output that was shown on the computer display indicates signal strength.